

ANALYSIS OF RADIO COMMUNICATION TOWERS SUBJECTED TO WIND, ICE AND SEISMIC LOADINGS

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ABSTRACT

The MoDOT radio communication tower network was created in the 1950s and 1960s. There is a need to assess the condition of the towers in the network and also to determine if they are up to date with current codes. A condition indexing (CI) system is a reliable assessment tool. However, an analytical method of determining the input parameters for the CI needs to be determined. Therefore, the objective of this research is to develop a systematic analytical procedure for predicting the response of the towers under natural hazards.

In this project, a guyed and a freestanding tower were modeled using ERITower and SAP2000 under wind, ice, and seismic loads. The effect of deterioration on the response of the towers was evaluated using a parametric study. The diagonal bracings controlled the capacity of the towers under wind and ice loading, whereas the guys were the most sensitive to deterioration under seismic loads.

The results of this project indicate that some components of the towers are critical and could control failure. It is recommended that detailed inspection of the towers' critical components be performed to develop a detailed risk assessment of the towers.